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2 PARTS — PART 2

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Vauban—
"First of Engineers and Best of Citizens"

By J. K. Finch

NO less a judge than Voltaire thus characterized a great man of his day. That century—the 17th—marked an age when engineering emerged a profession rather than a trade, an age when engineers began to be recognized as professional men, marked by those traits that have since become traditional with them. From earliest times the engineer has been distinguished by a simple honesty of thought, purpose, and action; by his untiring efforts and self-sacrificing devotion to duty. His work was fundamental to the progress of civilization but his reward was (and still remains, for that matter) a question of personal and ethical satisfaction rather than of material gain or public recognition.

Such a man lived in and for France from 1633 to 1706—Sebastian Le Prestre Vauban, an engineer, a "Builder of Fortresses."* Vauban did much to secure a fuller appreciation and an improved status for the engineer. Although primarily engaged in military problems, he knew the importance of the engineer in both military and civil life and endeavored to advance the standing and position of his profession.

Vauban was born in a typical country subdivision of Burgundy. He became a Marshal of France.

"At the age of seventeen," (he wrote in an "Epitome" of his service) he entered the army; and "having undergone fifty-two years of service, burdened with fifty considerable sieges and nearly forty years of perpetual journeyings and inspections of the frontier fortresses," was then in his seventy-third year.

It was to these fortresses and sieges that Vauban devoted his life. To quote Halévy: "Traffic in the frontier town of France today is checked for a moment as it passes his narrow gates. The sluices he

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*"Vauban, Builder of Fortresses" is the title of a fascinating volume, a translation by Major C. T. C. Street of a book by Daniel Halévy.

Canvassing Society Ballots

THE recent canvass of ballots on the Constitutional amendment presented an interesting instance of organization detail. Here is what happened:

Ballots began coming in seven weeks before the canvass was to be made. For a couple of weeks no thought was given to them, except to see that they were all carefully placed aside for later attention. This was easy because each envelope was of a distinctive color and plainly printed "BALLOT." About four weeks prior to the date of canvass and daily as they came in thereafter, the signature of each envelope was compared with the signatures of members filed when qualifying for membership, and each man's account was examined to determine if he was in arrears of dues and thus disenfranchised. All ballots found irregular were kept with the rapidly increasing accumulation, but were segregated.

After the last mail on the day of

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Ages for Society Membership

THE Constitutional amendment changing minimum membership requirements has as its essence the thought of granting to graduates of engineering schools a more equitable relation to those not so intensively trained.

To do this with assurance that the general qualifications would not be lowered seemed to necessitate changes also in the minimum age and the active practice requirements in certain cases. The amendment has been favorably adopted and a comparison of the age requirements of the Society as they will be hereafter with respect to those of other societies of similar nature may be of interest, although age is not the all-important point. Responsible charge has always been the real criterion upon which applicants are rated.

	Junior	Assoc. Mem.	Member
Am. Soc. C. E.	18	25	32
A. I. M. & M. E.	(a)	(a)	27
A. S. M. E.	21	27	32
A. I. E. E.	21(b)	27(c)	32(d)
E. I. C.	21	27	35
I. C. E. Gr. Brit.	—	25	33

(*a*)—*no age requirement.*
(*b*)—*known as Fellow.*
(*c*)—*known as Member.*
(*d*)—*known as Associate Member.*

It is regretted that abbreviation seemed necessary in the table. The full names of each society in the order given are: American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, American Institute of Electrical Engineers, Engineering Institute of Canada, The Institution of Civil Engineers (Great Britain).

What's in Proceedings

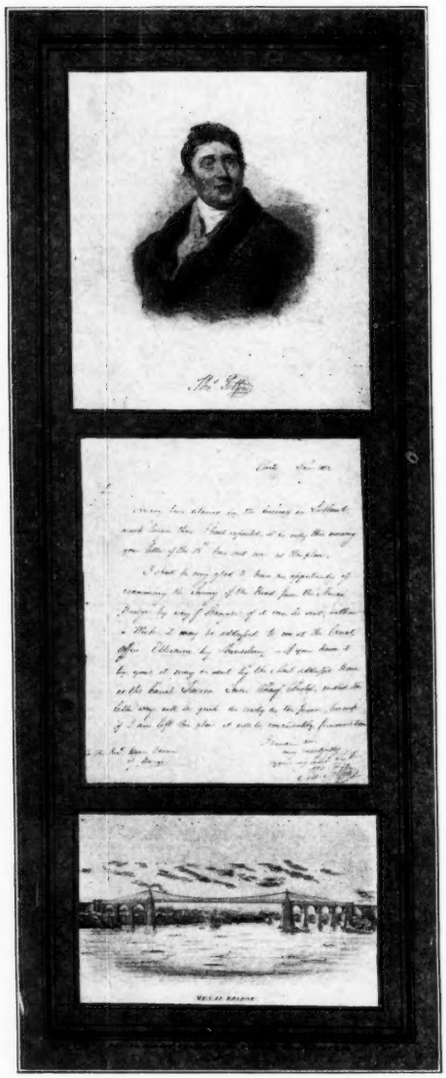
DOUBTLESS no one ever read an issue of Proceedings through. It is not done—nor for that matter would it be expected or considered good sense, especially as the volumes, judging by the last few numbers at least, are averaging 450 pages.

But aside from the question of size there are several good reasons why no one would be interested in reading from cover to cover. The volume is intended to include a wide range of Society matters and an understanding of each issue's make-up helps to a quick selection of those parts that may be of particular interest.

There are three divisions, each division paged separately for convenience of segregation if one is interested in doing that. "Items of Interest" contain matters chiefly in the nature of anouncements or of historical interest. This includes abstracts of the Minutes of the Board of Direction, of the Executive Committee, and of other committees' work and their reports. Then follow reports of Local Section meetings and Student Chapter meetings. Book notices and a digest of current periodicals, French, German, English and American, suggest the most recent publications on Civil Engineering subjects; and a page or two of announcements of members available for change of position affords one an opportunity to pick up a good man or to pick up a good job. Several pages recording elections to membership enables one to know who of his professional fellows has "joined up" and what he is doing. These parts taken together are styled "Society Affairs."

The second division consists of many pages giving the detailed professional experience of applicants for membership or transfer. If one is interested in maintaining the standard of quality of membership that has been set, he should at least scan this list carefully.

The third and main body of the volume contains "Papers and Discussions" on widely diverse subjects, each paper selected, by the Committee in charge of the publications, for its merit as a contribution to the fund of Civil Engineering knowledge and each discussion of value as it effectively confirms or disputes a point set forth. Attendance at meetings where papers are read may not be practicable, but as promptly as possible thereafter these papers are published, after careful editing to make them as valuable as possible to a reader who must supply his own emphasis, inflections, and interpretations. Remarks heard create quite a different impression from statements read, and it is the job of the editorial staff to make revisions with that thought conscientiously in mind.



Professor McMillan

In the last November issue, one year ago, a list was presented showing the 25 persons who had been connected with the Society for the longest period in any or all grades. First on that list was Charles McMillan. Professor McMillan died on September 19th last, at the age of eighty-six. He was elected to membership in the Society in 1868—fifty-nine years ago.

Engineering Relics

AN exhibit, consisting of an old engraving of John Telford, an original letter of his, dated 1812, and an engraving of his original design for the Menai Straits Bridge, has been assembled and presented to the Society by Charles Evan Fowler, Member.

The two pictures are of historic value but more particularly Telford's letter, addressed to the Rev. Dean Warren is interesting.

The letter reads:

"Sir: *"Chester, January,* 1912
"Having been detained, by the business in Scotland, much longer than I had expected, it is only this morning your letter of the 15th has met me at this place.

"I shall be very glad to have an opportunity of examining the Survey of the Road from the Menai Bridge by way of Bangor; if it can be sent, within a Week, it may be addressed to me at the Canal Office Ellesmere, by Shrewsbury. If you have it by you, it may be sent by the Mail addressed to me at the Canal Tavern Tower Wharf, Chester; indeed the latter way will be quite as ready as the former, because if I am left this place it will be immediately forwarded to me.

"I remain, Sir,
"Very respectfully,
"Your very humble Servt.,
"THOS. TELFORD."
"To The Revd. Dean Warren
of Bangor"

Note the location to which the letter is to be sent, the "Canal Tavern Tower Wharf"—quite in the German style of combining words. Note, too, that the engraving of the bridge is that which, quite by coincidence, was reproduced in "Engineering News-Record," September 29th last.

The exhibit with another, similarly arranged, and with original letters of Robert Stephenson (about 1860) and William Fairbairn (dated 1867) will be framed and hung in the Secretary's office until a more suitable place is found.

Miscellany

A member recently reported that, while prowling around a second-hand store (almost, if not quite, a pawn-broker's), he had seen displayed for sale a badge of the Society.

The badge was purchased, the expense being charged on the Society's books to "Current Business."

Many of our members want to know why the Society's envelopes are printed "upside down."

This comes about because Society mail is sent through a metering machine. This machine prints the postal permit (in lieu of a stamp) and also seals the envelope. In order to be used on this machine, the envelopes must be printed upside down.

Society Terminology

THE use or commonly accepted meaning of terms are often incorrect. Test yourself on some of these that follow:

"Chapter" refers to the authorized group of students at a school of engineering of recognized reputation who are organized as a civil engineering society, under the general guidance of a Faculty Sponsor, a Member or Associate Member of the Society.

"Section" refers to an authorized grouping of members of all grades in any locality. With some sections the locality is a city; with others it is a group of counties; with others a single State, and, in at least one case, it is a group of States.

"Division" refers to an authorized grouping of members of all grades interested particularly in one or another branch of engineering. It is to the Technical Division that the Society looks for intensive development of specific branches of engineering. They have definite portions of each quarterly meeting assigned to their charge.

The "Society" (not the "Parent Society") is the correct expression to use when speaking of the National organization in any of its phases or activities.

When the Society is referred to in writing and it is desired to abbreviate, the proper abbreviation is "Am. Soc. C. E.," not "A. S. C. E."

A few abbreviations are authorized: For Member, M. Am. Soc. C. E.; for Associate Member, Assoc. M. Am. Soc. C. E.; and for Junior, Jun. Am. Soc. C. E.

"Board of Direction" is the name of the governing body of the Society. Local Sections have "Boards of Directors."

"Proceedings" is the name of the publication that appears on the first day of the month. "Transactions" is the name of the annual volume. Proceedings contains much that does not appear in Transactions, which has primarily the character of a permanent record of technical matters of merit.

Seventy-Five Years

THE issue of the following circular, which was sent by several members of the profession to their engineering brethren in the City of New York and vicinity was the initial step resulting in the formation of the Society.

"New York, October 23d, 1852
"Dear Sir:

"A meeting will be held at the office of the Croton Aqueduct Department, Rotunda Park, on Friday, November 5th, at 7 o'clock P. M., for the purpose of making arrangements for the organization, in the city of New York, of a Society of Civil Engineers and Architects.

"Should the object of the meeting obtain your approval, you are respectfully invited to attend.

"Wm. H. Morrell, Wm. H. Sidell, J. W. Adams, A. W. Craven, James Laurie, James P. Kirkwood, and others."

The meeting was held, Mr. Craven presiding; a constitution and qualifications for admission were adopted; officers were chosen; and an address to be sent to those engineers and architects of the United States considered by the Board of Direction eligible for membership was adopted and ordered promulgated. Certain quotations are of significance:

"It becomes our duty, in conformity to a resolution of said Society, to address such members of the respective professions as are known to us throughout the country, and, laying before them in brief the result of their deliberation, invite them to cooperate in a furtherance of the aims and objects of the Society, so far as they may be found to accord with their individual views. Such gentlemen only as receive this circular are eligible as members of the Society by a bare notice of their desire to become such and a compliance with the accompanying forms (on or before December 1st, 1852). All others will be elected by ballot in conformity with the requirements of the Constitution.

"The Constitution of the Society declares that it has for its object:

"The professional improvement of its members, the encouragement of social intercourse among men of practical science, the advancement of engineering in its several branches, and of architecture, and the establishment of a central point of reference and union for its members."

Thus what is now known as the American Society of Civil Engineers was formed seventy-five years ago.

November Proceedings

ANOTHER imposing number of Proceedings marks the November issue. It includes a decidedly unusual set of papers and an unusually large number of discussions.

The subject of "Aerial Tramways" is not altogether familiar to engineers. Fred C. Carstarphen, Member, gives a complete outline covering the various types, arrangement, capacity, engineering details and mathematics of design.

Then follow three descriptions of various phases of hydraulic work on the Pacific Coast. In a short paper on "The Head-Works of the Imperial Canal," C. E. Grunsky, Past-President, describes an interesting intake founded on sand.

By means of "Baffle Pier Experiments on Models of Pit River Dams," I. C. Steele and R. A. Monroe, Members, were able to learn important facts concerning the best methods of absorbing shock of falling water for these particular layouts.

A third hydraulic paper, treating of, "Maximum Flood Discharge in San Joaquin Valley, California," is by Oren Reed, Junior Member. He develops an interesting method for predicting storm characteristics based on experiences of neighboring streams.

Singularly enough, two other papers deal with hydraulic work—these relate to hydro-electric development in the East. "Re-Designing Catawba Station for Service on a Large Transmission System," by W. S. Lee, Member, describes an interesting case of reconstructing a plant twenty-five years old in South Carolina. This paper was presented before the Power Division at the Asheville Meeting.

The other hydraulic paper, presented before the same Division at the Philadelphia Convention, is by Alexander Wilson, 3d, Engineer of the Philadelphia Electric Company, on the topic, "The Conowingo Hydro-Electric Development on the Susquehanna River." This description of construction on one of the outstanding power developments in the East made the fifth paper dealing with hydraulic or hydro-electric subjects in the November Proceedings.

The remaining paper, entitled,

"The Science of Foundations—Its Present and Future," by Charles Terzaghi, Member, was presented before the Structural Division at the last Annual Meeting. The viewpoint expressed in this exhaustive treatment is unique and is based on years of experimental work.

The extensive discussions number fifty-four in all, covering sixteen different papers. Memoirs of 7 deceased members are also included.

Vauban

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planned at Dunkirk in 1680 were used by the engineers of 1914 to flood the low lands of Nieuport and Dixmude and close that frontier to Germany. His bastions overlook the plains of Flanders; they are reflected in the waters of the Mediterranean."

Vauban began his career under Condé and won renown by swimming across the Aisne at St. Menehould, leading an attack. By good luck, he was removed from the confusion of a civil war by being captured by the King's troops. Mazarin is credited with having converted him to the Royal cause; and at the age of twenty-two he received his commission as Engineer in Ordinary to the King. "From that moment he served and fought unceasingly."

The war with Spain (1669) gave Vauban an opportunity to show what he could do in sieges and attacks. It also brought him for the first time into contact with one of his greatest works—Dunkirk. The sea, which he planned to use in works of defence, silted up the creek in which the King was determined to moor his fleet.

Here Vauban showed his skill. He planned to dam and collect the waters of the Flemish plain, and, then, by opening the sluices, to wash away the sand bank which obstructed the harbor. It was not until nine years afterward, however, that his plan could be carried out and it was even later that he could complete his work at Dunkirk, including the jetties and the famous Rixban, a fortress built on pile foundations on a shifting sand-bar in the harbor.

The Peace of Luxembourg brought to Vauban the problems of the water supply for Versailles. In 1687 he visited the Canal de Deux Mers and made plans for improvements later carried out. Peace brought him, too, the opportunity, and an impelling desire, to study and report on the effect of the revocation of the Edict of Nantes. He was an economist and an advocate of statistical studies as well as an engineer.

In 1703, at the age of seventy, he became a Marshal of France, a tardy honor, long deserved, and one that troubled him much for he could no longer attend to the details of his work in person. He had to "live up" to the dignity of his position. He was still called upon, however, for advice. Indeed, he once more went back to Dunkirk, this time as commander, prepared to defend it against an attack which did not materialize. The enemy picked more vulnerable spots, where there was no Vauban.

Vauban has been described as a rough and ready genius. It is true that he was no courtier, was scarcely a noble, and that he was more at home with his contractors and engineers than in a Galerie des Glaces at Versailles. It is also true that his morals were those of his day, his love affairs required a secret will for the confidential disposal of forty thousand livres. But no one has ever questioned the high professional ethics, the unswerving devotion to duty, the ardent love of king and country, the constant interest in his engineers and the welfare of the public, which so marked this man of Old France.

"Old"—but Not "Aged"

LITTLE else than a highly developed condition of mutual esteem it seems can account adequately for the many years that several of the valued members of the Headquarters Staff have been thus connected with the Society.

Of those still in the harness, one has been continuously serving the Society for 30 years this month, and two others for over 28 years. One other has a continuous record of over 21 years, another of 18 years, another 16, another 15, another 14, and another 12 years. Seven others have been members of the old guard for between 5 and 10 years.

Their work, however, has changed during these many years as may be guessed from a glance at the membership figures. Thirty years ago, the total membership was 2,018. Twenty years ago, it was 3,917. Ten years ago, it was 8,192 and, to-day, it is over 12,400.

Canvassing Society Ballots

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the canvass, the eligible ballots were placed in groups of 150, the last group, of course, being what may be called a broken lot. Upon the arrival of the Chairman of the Tellers, the ballots laid aside as irregular were discussed and such as he approved added to the last lot. A calculation of the total number of ballots was then made and permission given to open the outer envelopes of the first group of 150.

Here the rapid action started. The outer envelopes were trimmed by an electrical machine which made short work of the job, and the slitted envelopes were carried to a table at which sat ten employes at Headquarters. These girls removed the inner envelopes which when assembled were also trimmed in the machine and returned to the table, that the ballot might be taken out.

The next work was that of the Tellers, who are members of the Society. They worked in pairs, each pair taking 150 ballots. These they divided into two approximately equal parts and each sorted his portion into three groups, "Yes," "No," and "Irregular." Each then determined how many he held of each kind. They then "swapped" and a second count was made. If there was agreement and the total was 150 they were ready to report, and did so on a prepared form which, with the ballots, was turned over to the Chairman. He tabulated the returns and when the last pair of Tellers reported, the footing of the columns gave the result, accounting for all ballots cast.

The scene was quite interesting. At one end of the fine Board Room were the girls; and twenty of them were hardly enough as it takes longer to slit the envelopes and remove the ballots than it does to count them. At the other end of the room, seated in pairs, were the men, sorting, counting, and reporting. Only two people moved about: the Chairman in charge of the Tellers, in this case Mr. L. D. Rights, and the Office Manager, Miss Frick, in charge of the staff of helpers.

At the recent canvass 3533 ballots were counted in 40 minutes by 16 tellers. The work of preparation for the count requires the equivalent of one person's attention for about 21 days.